AD_____

GRANT NUMBER DAMD17-95-1-5064

TITLE: Study of Chlamydia Trachomatis in Military Women; Prevalence, Risk Factors, and a Cost Benefits Analysis of Early Diagnosis and Treatment

PRINCIPAL INVESTIGATOR: Charlotte Gaydos, Dr.P.H.

CONTRACTING ORGANIZATION: Johns Hopkins University
Baltimore, Maryland 21205-2196

REPORT DATE: September 1997

TYPE OF REPORT: Annual

PREPARED FOR: Commander
U.S. Army Medical Research and Materiel Command
Fort Detrick, Frederick, Maryland 21702-5012

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. AGENCY USE ONLY *(Leave blank)*	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	September 1997	Annual (31 Aug 96 - 30 Aug 97)

4. TITLE AND SUBTITLE
Study of Chlamydia Trachomatis in Military Women; Prevalence, Risk Factors, and a Cost Benefits Analysis of Early Diagnosis and Treatment

5. FUNDING NUMBERS
DAMD17-95-1-5064

6. AUTHOR(S)
Charlotte Gaydos, Dr.P.H.

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
Johns Hopkins University
Baltimore, Maryland 21205-2196

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)
Commander
U.S. Army Medical Research and Materiel Command
Fort Detrick, Frederick, MD 21702-5012

10. SPONSORING/MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION / AVAILABILITY STATEMENT
Approved for public release; distribution unlimited

12b. DISTRIBUTION CODE

13. ABSTRACT *(Maximum 200*

This ongoing study used urine LCR to determine the prevalence of and risk factors for chlamydial infections among military females. Three different populations were screened: recruits who were beginning military service, symptomatic patients attending a Troop Medical Clinic (TMC), and asymptomatic women having a PAP test. Urine specimens and questionnaires were collected. Urines were tested by LCR (Abbott Labs); PAP patients were also tested by cervical culture. In 10,361 women screened from 1-96 to 6-97, prevalence was 9.1%. The recruits, TMC, and PAP populations had prevalences of 9.0%, 11.9%, and 7.3%, respectively. The mean age was 22; 50.5% were Caucasian; 94% were sexually active, 25.3% had more than 1 sex partner in the last 90 days; and 29.2% had a new sex partner; 16.2% used condoms consistently; and 9.4% had a previous chlamydial infection . Compared to cervical culture, LCR sensitivity was 88.6% (asymptomatic group, N=434). Multivariate analysis of the recruit population (N= 9,192) identified several significant risk factors useful for predicting chlamydial positivity: young age (OR 3.4), African-American race (OR 2.7), vaginal sex (OR 4.1), more than 1 sex partner (OR 1.4), and a new partner (OR 1.5). For the recruit population, a screening program based solely on young age (≥25) could detect 95.8% of the positives while only screening 87.2% of the population. Preliminary analysis indicates mass therapy is potentially cost-effective in preventing the disease.

14. SUBJECT TERMS	15. NUMBER OF PAGES
Defense Women's Health Research Program	45
	16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
Unclassified	Unclassified	Unclassified	Unlimited

FOREWORD

Opinions, interpretations, conclusions and recommendations are those of the author and are not necessarily endorsed by the U.S. Army.

NA Where copyrighted material is quoted, permission has been obtained to use such material.

NA Where material from documents designated for limited distribution is quoted, permission has been obtained to use the material.

CA Citations of commercial organizations and trade names in this report do not constitute an official Department of Army endorsement or approval of the products or services of these organizations.

NA In conducting research using animals, the investigator(s) adhered to the "Guide for the Care and Use of Laboratory Animals," prepared by the Committee on Care and Use of Laboratory Animals of the Institute of Laboratory Resources, National Research Council (NIH Publication No. 86-23, Revised 1985).

CA For the protection of human subjects, the investigator(s) adhered to policies of applicable Federal Law 45 CFR 46.

NA In conducting research utilizing recombinant DNA technology, the investigator(s) adhered to current guidelines promulgated by the National Institutes of Health.

NA In the conduct of research utilizing recombinant DNA, the investigator(s) adhered to the NIH Guidelines for Research Involving Recombinant DNA Molecules.

NA In the conduct of research involving hazardous organisms, the investigator(s) adhered to the CDC-NIH Guide for Biosafety in Microbiological and Biomedical Laboratories.

Charlotte Gaydos, Dr. P.H 9-23-97

PI - Signature Date

TABLE OF CONTENTS

INTRODUCTION

Chlamydia trachomatis infections in the U.S. exceed 4 million cases, annually. Since chlamydial infection may initially be asymptomatic in 70% of women, they frequently remain undiagnosed, resulting in acute and chronic sequelae, such as cervicitis, endometritis, pelvic inflammatory disease, ectopic pregnancy, and infertility. In the U.S., the annual costs of chlamydia infections and their sequelae are estimated at $5 billion. Infection rates for young, sexually active women range from 5-20%, with rates highest for those under 21, suggesting a high prevalence in incoming female recruits. For example, military PID rates are approximately 5 times higher than the national level. However, a comprehensive prevalence study among military women has never been performed.

Since urine samples have now been demonstrated to be excellent specimens for the detection of *C. trachomatis* when tested by the new molecular DNA amplification test, Ligase Chain Reaction (LCR), it is now possible to rapidly, easily, and accurately screen large numbers of patients for chlamydial infection. Our laboratory had extensive experience in the clinical trials evaluating the LCR test and currently performs the assay routinely for up to 800 samples per week.

This grant will implement and evaluate a chlamydia screening program of active-duty female soldiers. Based upon findings of the study, recommendations will be made for an effective, cost-efficient chlamydia control program designed to reduce morbidity due to *C. trachomatis.*

The objectives of this study are to

1. Determine the prevalence of infection in several military female populations;
2. Determine risk factors predictive of infection;
3. Conduct a cost-effectiveness analysis comparing universal screening versus selective screening utilizing risk factor criteria;
4. Recommend a chlamydial control program: selective screening and treatment;) universal screening and treatment; or,) mass therapy for all female basic recruits. Utilizing ICD codes, we will monitor PID and ectopic pregnancy rates, over the 3 year period of chlamydia screening.

BODY

METHODS

POPULATIONS AND SPECIMENS.

Three female military populations were studied: Recruits undergoing in processing at the Reception Battalion, Ft. Jackson; Symptomatic active-duty women at the Troop Medical Clinic at Ft. Jackson; and females having a PAP test performed at Ft. Bragg. All participants were voluntarily recruited into the study by a civilian study nurse and have signed a consent form approved by the respective institutional review boards.

Each subject completed a questionnaire for demographic information and sexual risk factor history and provided a urine sample. The questionnaire was a one page, two-sided scannable bubble-form (Scantron Corporation, Tustin, CA). In addition, a endocervical swab for chlamydia culture was obtained by the attending clinician from the volunteers from Ft. Bragg's PAP clinic. Cultures were placed into chlamydia transport medium (2SP). All specimens, consent forms, and questionnaires were shipped to Johns Hopkins University Chlamydia Laboratory, under appropriate environmental conditions (-20^0 C for urine specimens and on dry ice for the culture specimens).

To determine comparability of the volunteer and non-volunteer recruits at the Reception Battalion, with regard to demographics and risk history, a sub-sample of those non-volunteering recruits were invited to anonymously fill out a questionnaire. This sub-sample was collected on the first Sunday of each month.

CHLAMYDIA TESTS.

Urines were processed and tested by ligase chain reaction (LCR) [Abbott Labs, Abbott Park, IL] for chlamydial DNA, according to manufacture's directions. The LCR test is now

approved by the FDA for use with both urine and endocervical specimens. The chlamydia cultures were performed in 96-well microtiter plates using McCoy cells, according to standard laboratory procedure.

Discrepant analysis was performed on any discordant sample results from the PAP population at Ft. Bragg.(Discordant defined as either: 1) culture positive/LCR negative; or, 2) culture negative/LCR positive. For the former, LCR was repeated from the stored, frozen aliquot of processed urine, and if still LCR negative, the processed LCR specimen was diluted 1:10 and retested by LCR. In addition, polymerase chain reaction (PCR, Roche Molecular Systems) was performed on a stored frozen aliquot of urine. For the latter, the culture fluid sediment was stained by Direct Fluorescent Antibody (Syva, San Jose, CA) in order to visualize any elementary bodies, characteristic of chlamydia. If positive, this confirmed that the LCR was a true positive test. If the DFA was negative, further testing of the culture fluid by PCR was performed. If the PCR was negative, the LCR was considered to be a false positive test. If the PCR was positive, the LCR result was considered to be a true positive test). The results of these tests were used to determine the sensitivity and specificity of the LCR urine assay as used for this population (PAP).

The scan forms were scanned into a data set (d-base III) and the LCR results, demographics, and risk factor information were analyzed using chi-squared test, Fisher's tests of exactness and logistic regression analysis (Stata, College Station, TX). Data for the multivariate models were recoded as dichotomous variables (presence of risk vs. no risk) according to the findings of the univariate analyses. A cost-effectiveness analysis was conducted using a cost and outcome based decision tree designed in Smltree (Jim Hollenberg, NY 2.9). All consent forms, as well as the original Scantron forms, were stored in a locked file cabinet.

RESULTS

The following anlyses were conducted on cummulative data from January 21, 1996 through June 22, 1997 (see Appendix A for annual break down of data). The exception being the cost-effectivness analysis which was conducted in March, 1997 for report at the Third Annual Uniformed Services Recruit and Trainee Health Care Symposium: 19-21 May 1997, Walter Reed Army Institute of Research; Washington, D.C. (Appendix B)

RECRUITS, FT JACKSON: Of 11,777 recruits presenting at the Physical Exam Station, 9,209 (78.2%) volunteered from January 21 to June 23, 1996. This is a 12 percentage point increase over last year's performance. Seventeen individuals either had unevaluable urine specimen or they were missing more than two data items. Evaluable data from 9,192 recruits showed: 87.2% (8012/9192) were age 25 or younger, 51.9% (4771/9192) were Caucasian, 35.1% (3225/9192) were African American, and 13% (1196/9192) were other races. The prevalence for *C. trachomatis* by urine LCR for the population was 9.0% (828 of 9,192).

By questionnaire, 93.6% (8602/9192) reported having had vaginal sex, 26% (2390/9192) had more than 1 sex partner in the previous 90 days, 30.5% (2806/9192) had a new sex partner in the previous 90 days, and only 15.5% (1429/9192) always used condoms. A prior history of chlamydial infections was reported in 8.8% (806/9192), gonorrhea in 3.2% (291/9192), syphilis in 0.6% (52/9192), and trichomonas infection in 4.5% (415/9192).

By age, prevalences for chlamydia were: 10.95% (age 17-20); 8.01% (age 21-25); 3.14% (age 26-30); and 1.85% (age 31-35). For further analyses, the 2 youngest age categories were combined into a variable called "young" (age 17-25; prevalence 9.9% 793/8012). By race, prevalences were 5.3% for Caucasian, 14.4% for African American, and 9.1% for others.

Univariate analysis identified 5 significant risk factors: young age (17-25 years), African

American, ever having vaginal sex, > 1 sex partner, and new sex partner. Condom use and prior diagnosis of chlamydia, gonorrhea, syphilis, or trichomonas were not significant. In the multivariate model, the variables useful as predictors for chlamydial infection were vaginal sex (OR 4.08, 95% C.I. 2.28-7.29), young age (OR 3.41, 95% C.I. 2.41-4.82), African American (OR 2.71, 95% C.I. 2.34-3.14), more than 1 sex partner (OR 1.41, 95% C.I. 1.17-1.70) and having a new sex partner (OR 1.49, 95% C.I. 1.23-1.79). This population is predominantly young sexually active women. Thus, the population is high risk by definition according to other published studies . If young age alone was used as the screening criteria 87.2% of the population would be tested, including 95.8% of the positives. If sexual activity defined as sexual intercourse was used as the screening criteria 93.6% of the population would be tested, including 98.6% of the positive individuals. Combining these two factors would require screening 99.5% of the population, including 100% of the positives. A truly selective sample of the population would be those with reported high risk behaviors such as more than one sex partner or a new sex partner. However, screening on these criteria alone would require testing 20.1% of the population including only 31.5% of the positives. The cost-effectiveness of these screening strategies will be addressed in the final cost-effectiveness analysis.

Non-volunteer Recruits, Ft. Jackson: There were 610 women who filled out a questionnaire, anonymously: very few women had data evaluable for age determination. 33.4% were African American, not significantly different from the volunteers; 3.0% had prior chlamydia, 69.5% had vaginal sex, 17.9% had a new sex partner, and 55.7% did not consistently use condoms(all five characteristics significantly different from those of the volunteers even when vaginal sex was controlled for). 17.9% of the non-volunteers had more than one sex partner in the prior 90 days. This did not differ significantly from the volunteers when vaginal sex was controlled for, however.

TMC PATIENTS, FT JACKSON: Volunteers included 672 symptomatic soldiers. The volunteer rate of those approached was 80%. Demographics included: 85% (571/672) were 25 years of age or younger, 51.2% (344/672)were African American. 12.5% (84/672) had a prior history of chlamydia, 96% (645/672) reported vaginal sex, 23.7% (159/672) had a new sex partner in the previous 90 days, 23.1% (155/672) had more than one sex partner in the past 90 days, and 71 % (480/672) did not consistently use condoms.

Prevalences of chlamydia for this symptomatic group of patients were: 11.9% (80/672) overall; 12.8% for $\leq$ 25 yr.; 7.9% for Caucasian; and 15.4% for African American. The prevalence of chlamydia by risk category included: prior chlamydia, 13.1%; vaginal sex, 12.3%; new sex partner, 12%; more than one sex partner in the last 90 days, 13.6%; and inconsistent condom use 11.6%.

PAP PATIENTS, FT BRAGG: The volunteer rate approached was 71%. Among 479 asymptomatic volunteers, and one reporting mild symptoms (N=480), demographics included: 55.2% (265/480) were 25 years or younger, 50.8% (244/480) were African American. 17.9% (86/480) had a history of chlamydia, 4.2% (20/480) Gonorrhea, 1.0%(5/480) syphilis, and 8.5% (41/480) trichomonas. 98.3% (472/480) reported vaginal sex, 11.3% (54/480) had a new sex partner in the previous 90 days, 15.2% (73/480) had more than one sex partner in the past 90 days, and 88.5% (425/480) had inconsistent condom use. 30.8% were pregnant.

Fifteen individuals had urine specimen which were missing or unevaluable. Of the remaining 465, the prevalences for chlamydia infection (based on DNA amplification positivity) were: 7.3% (34/465) overall; 11.0% for $\leq$ 25 yr.; and 8.9% for African American and 6.5% for pregnant women. The prevalence of chlamydia by risk category included: prior chlamydial

infection, 3.6%; vaginal sex, 7.4%; new sex partner in the prior 90 days, 15.1%; more than one sex partner in the last 90 days, 10.3%; and inconsistent condom use, 7.5%.

In univariate analysis only young age (OR 4.23, 95% C.I. 1.72-10.43) and new sex partner (OR 2.61 95% C.I. 1.11-6.1) were predictors of chlamydial infection. However, when controlling for age new sex partner was no longer significant.

Ft. Bragg Population Comparison of urine LCR to cervical culture for C.trachomatis (Asymptomatic Population).

There were a total 480 women enrolled from the Ft. Bragg asymptomatic population (PAP Clinics) since the beginning of the study. Of these, there were 46 women, who did not have matching specimen results for comparison. The reasons included: 10 tissue culture toxic cervical culture results and 36 for which there was no cervical culture collected or no urine collected. After removal of these non-matched specimens, there were 434 for comparison purposes. See Tables below.

For the 4 specimens that were positive by culture and negative by urine LCR (4), it was considered by convention that culture was 100% specific and that they were true positives.Thus these were false negatives by LCR.

For the 11 specimens that were culture negative and positive by urine LCR (11), it was considered that they may be true positives or false positives. In order to resolve these discrepant results, another method of analysis was used as a "tie-breaker test". It is well known that chlamydia culture is not 100% sensitive.

The first step in this analysis was to sediment the culture transport vial and to perform a direct fluorescent antibody (DFA) stain for chlamydial elementary bodies (EBs). If Ebs were present it was considered that the culture was falsely negative and the positive LCR result was

confirmed as a true positive.

Additional tests were performed to confirm the positive LCR result as a true positive result. These included repeating the urine LCR, performing PCR for chlamydia (Roche Diagnostic Systems, Bromchburg, NJ) and a research PCR (OMP-1 based) for chlamydia on the archieved urine specimen, and performing LCR for a different DNA target (OMP-1 gene) on the archieved urine specimen. Using these methods of further analysis, all but one positive LCR urine specimen was resolved as a true positive specimen.

		Culture +	Culture -
LCR	+	21	11
	-	4	398

LCR

		Infected Status +	Infected Status -
	+	31	1
	-	4	398

Resolved: Sensitivty	88.6%	Specificity	99.7% Positive
Positive Predictive Value	96.9%	Negative Predictive Value	99.0%

The Ft. Bragg portion of the project is now complete. A manuscript is in progress.

Cost-effectiveness Analysis: Preliminary Cost-Effectiveness Analysis: We compared universal screening of all recruits to screening only those recruits under 25 years of age and to provision of azithromycin for all recruits at the PES. We estimated that 50% of women developing symptomatic PID within the first 6 months of service would receive an EPTS discharge.

In an estimated annual recruit population of 13, 236 with a chlamydial prevalence of 9.56%, no screening for *Chlamydia trachomatis* would result in a projected illness cost of $973,000 over a five year period for treatment of 316 cases of silent and symptomatic pelvic inflammatory disease (PID) and related sequelae (chronic pelvic pain, ectopic pregnancies, and infertility).

Screening only those recruits under the age of 25 would require testing 86% of the population and would identify 95% of the chlamydial infections. This screening strategy would cost approximately $121,000 in screening and treatment expenditures but would save approximately $580,000 in future sequelae costs including cost of lost training expenditures due to EPTS discharges. This strategy would prevent 227 cases of silent and symptomatic PID.

Testing all recruits would cost an additional $17,000 but would prevent 12 more cases of PID than screening only young recruits, saving $37,000 in sequelae costs, including EPTS losses, for an overall savings of approximately $20,000 over screening only young recruits.

Mass therapy is the most expensive intervention strategy (approximately $16 per woman), costing $70,000 more than universal screening. However, this strategy would prevent 32 additional cases of PID saving $98,000 in sequelae costs for a total savings of $28,000 over universal testing.

In the recruit population studied, mass therapy appears to be the cost-effective strategy

relative to no screening, screening only young recruits, or testing all recruits. Mass therapy provides for the prevention of chlamydial sequelae and the associated EPTS discharges. Further analysis is underway.

DISCUSSION IN RELATION TO STATEMENT OF WORK AND PROBLEMS.

For Year Two, the Statement of Work as stated in the grant included 3 tasks.

#5. **Proposed**: Screening. We will continue to screen approximately 15,000 women by urine LCR at Ft. Jackson to monitor prevalence. Treatment with azithromycin, 1.0 gram dose orally, wll be offered to those who are infected with chlamydia.

Performed: Recruitment at Ft. Bragg was completed with a total of 480 asymptomatic women enrolling. Collection continues at the PES at Ft. Jackson. A total of 9209 have volunteered. The total enrollment of symptomatic women at Ft. Jackson's TMC is now 672. Chalmydia positive individuals have been notified and treatment has been documented (1.0 gram dose, orally azithromycin).

Issues: The departure of a second study nurse necessitated down time to hire and retrain a third nurse. Physical relocation of the clinic resulted in lost collection in February, 1997. Recruitment continued to be difficult;i.e., inconsistent show rates for clinic appointments. A decision was made that sufficient test data had been collected in an asymptomatic population to predict the sensitivity and specificity of the urine LCR as compared to cervical culture.

#6.. **Proposed**: Regression analysis. We will determine by regression analysis which risk factors are predictive of chlamydia infection in each of the above population groups.

Performed: The regression analysis for 9,192 female recruits is nearly complete. See Results. It appeared that young age (≤25 yrs.) alone could provide an adequate risk factor upon which to base selective screening; i.e., 87.2% of the population screened would detect 95.8% of positives.

#7. **Proposed**: Cost Analysis. We will determine by cost analysis whether it is more efficient to universally screen and treat, to selectively screen based on risk factors and treat, or to mass treat all female recruits with azithromycin.

Performed: Preliminary cost -effectiveness analysis has demonstrated that although mass therapy would appear to be the most expensive intervention strategy, it has the potential to prevent additional cases of PID and other sequalae, providing an overall savings over universal screening in this population.

The decision as to the intervention to be implemented for the 3rd year of collection (January, 1998) is under consideration by our military and civilian collaborators, the Armed Forces Epidemiology Board and the Institutional Review Boards of Johns Hopkins University and Ft. Jackson (Eisenhower, Ft. Gordon).

Issues: The final cost-effectiveness analysis is pending with several issues yet to be resolved by a panel of experts and our military and civilian consultants as to Army specific probabilities and costs to be used in the final model. Such unknowns include:

1. Probability of EPTS for discharge due to symptomatic PID;
2. Number of outpatient visits associated with PID;
3. Probability of PID (Army- specific). We have literature reported probability.
4. Probability of Azythromycin associated side effects/cost in military recruits. We only have literature reported data.

5. No Army-specific cost of chronic pelvic pain and ectopic pregnancy.

These issues are under considerationby our panel as mentioned above in order to decide whether to use data available from civilian sources or to ascertain military specific data, if possible.

CONCLUSIONS

Urine-based screening for *C. trachomatis* by Ligase Chain Reaction was effective in a female military recruit population, as well as in a symptomatic Troop Medical Clinic population and an asymptomatic PAP clinic population. Acceptance was high, the urine specimens were readily obtained, and the assays were able to be performed quickly and efficiently.

The study has demonstrated a high prevalence (9.0%) for female recruits from a geographically and demographically diverse group, a substantial prevalence (11.9%) from a symptomatic Troop Medical Clinic population, and a higher than expected prevalence (7.3%) from an asymptomatic PAP clinic population. These results have indicated the need for an ongoing chlamydial control program in such female military groups.

Among recruits, risk factor analysis by multivariate logistic regression identified five independent, statistically significant, predictors for being infected with chlamydia: young age, African American,vaginal intercourse, more than one new sex partner, and a new sex partner in the prior 90 days. Women that volunteered from the recruit population appeared to have behavioral characteristics that put them at high risk for chlamydial infections. Women, who were non-volunteers appeared to be similar demographically and many also practiced high risk behavior, but were significantly less likely to have these risk factors (prior chlamydia infection, vaginal sex, new sex partner, more than one sex partner, and inconsistent condom use) than were the volunteers.

Although the women from the symptomatic (TMC) and asymptomatic (PAP) groups had prevalences that were higher than the recruit population, their demographic and risk factor profiles were similar. The numbers of women enrolled at the present time are insufficient to perform univariate or multivariate regression analyses.

A chlamydial screening program that focused on screening all young female recruits (age 25 or less) would require that 87.2% of this population would be screened and 95.8% of all positive infections would be identified. Such a screening program as this, which employed urine LCR testing, has the potential to prevent pelvic inflammatory disease and ectopic pregnancy in Army women.

REFERENCES

1. Recommendations for the prevention and management of Chlamydia trachomatis infections. *MMWR* 1993;42:1-39.

2. Quinn TC, Zenilman J, Rompalo A: Advances in diagnosis and treatment, in Schrier RW, Abboud FM, Baxter ID, Fauci AS (eds): *Sexually Transmitted Diseases*. St. Louis, Mosby; 1994:149-196.

3. Jaschek G, Gaydos C, Welsh L, Quinn TC: Direct detection of Chlamydia trachomatis in urine specimens from symptomatic and asymptomatic men by using a rapid polymerase chain reaction assay. *J Clin Microbiol* 1993;31:1209-1212.

4. Braverman PK, Biro FM, Brunner RL, Gilchrist MJR, Rauh JL: Screening asymptomatic adolescent males for chlamydia. *J Adolesc Health Care* 1990;11:141-144.

5. McCormack WM: Pelvic inflammatory disease. *Curr Con* 1994;330:115-119.

6. Catterson ML: Prevalence of asymptomatic chlamydial cervical infection in active duty army females. *Mil Med* 1993;158:618-619.

7. Lavin B, Putnam S, Rockhill R, Schachter J, Oldfield E: Asymptomatic carriage of Chlamydia trachomatis and Neisseria gonorrhoeae in active duty males deployed to the western pacific. *ICAAC* 1991;110:72-(abstract).

8. Orndorff GR: Screening for Chlamydia trachomatis by the direct fluorescent antibody test in female Navy recruits. *Mil Med* 1991;156:675-677.

9. Pfaff JA, Pimentel L: Chlamydial antigen testing on female patients presenting to the emergency department. *Mil Med* 1991;156:362-364.

10. Boyd RS, DeMaio J: Use of Chlamydiazyme on urine sediment for diagnosis of Chlamydia trachomatis genital infections. *Mil Med* 1991;156:420-421.

11. Malone JD, Hyams KC, Hawkins RE, Sharp TW, Daniell FD: Risk factors for sexually-transmitted diseases among deployed U.S. military pàersonnel. *Sex Transm Dis* 1993;294-298.

12. Pena AC, Adkins HJ: Prevalence and clinical profile of Chlamydia trachomatis as a cause of urethritis and cervicitis in Filipinos: a preliminary report. *Phil J Microbiol Infect Dis* 1986;15:41-45.

13. Podgore JK, Holmes KK, Alexander ER: Asymptomatic urethral infections due to Chlamydia trachomatis in male U.S. military personnel. *J Infect Dis* 1982;146:828.

14. Welsh LE, Gaydos CA, Plier P, Burczak J, Lee H, Quinn TC: Ligase chain reaction: a new molecular non-culture method for detection of Chlamydia trachomatis infection. *ICAAC* 1993;43:504-(abstract).

15. Gaydos CA, Jang D, Welsh LE, et al: Ligase chain reaction(LCR): A novel DNA amplification technique for Chlamydia trachomatis in male urine. *Inter Soc Std Res* 1993;p77-(abst).

16. Chernesky M, Lee H, Jang D, et al: Detection of female Chlamydia trachomatis infection of the lower genital tract by testing first void urine in the ligase chain reaction. *Inter Soc Std Res* 1993;p80-(abst).

17. Public Health Service : *Healthy People 2000 National Health Promotion and Disease Prevention Objectives*, Washington,D.C., U.S. Department of Health and Human Services; 1990:

18. Wasserheit JN: Epidemiological Synergy: Interrelationships between Human Immunodeficiency Virus and Other Sexually Transmitted Diseases. *Sex Trans Dis* 1992;19:61-77.

19. Plummer FA, Simonsen JN, Cameron DW, et al: Cofactors in Male-Female Sexual Transmission of Human Immunodeficiency Virus Type 1. *J Infect Dis* 1991;163:233-239.

20. Laga M, Manoka A, Kivuvu M, et al: Non-ulcerative sexually transmitted diseases as risk factors for HIV-1 transmission in women: results from a cohort study. *AIDS* 1993;7:95-102.

21. Stergachis A, Scholes D, Heidrich FE, Sherer DM, Holmes KK, Stamm WE: Selective Screening for Chlamydia trachomatis infection in a primary care population of women. *Amer J Epidemiol* 1993;138:143-153.

22. Weinstock HS, Bolan GA, Kohn R, Balladares C, Back A, Oliva G: Chlamydia trachomatis infection in women: A need for universal screening in high prevalence populations? *Amer J Epidemiol* 1994;135:41-47.

23. Mrrazzo JM, Celum CL, Fine D, DeLisle S, Mosure DJ, Handsfield HH: Cost-effectiveness of selective vs. universal screening for Chlamydia trachomatis infection in women attending family planning and STD clinics, in Orfila J, Chernesky MA, Grayston JT, et al (eds): *Chlamydial infections*. Bologna, Esculapio; 1994:63-66.

24. Scholes D, Stergachis A, Heidrich FE, Andrilla HA, Holmes KK, Stamm WE: Selective screening for chlamydia reduces the incidence of pelvic inflammatory disease: results from a randomized intervention trial, in Orfila J, Byrne GI, Chernesky MA, et al (eds): *Chlamydial infections*. Bologna, Esculapio; 1994:28-31.

25. Katz BP, Blythe MJ, Van Der Pol B, Jones RB: Evaluation of a chlamydial control program among adolescent women, in Orfila J, Byrne GI, Chernesky MA, et al (eds): *Chlamydia infections* Bologna, Esculpio; 1994:48-1.

26. Hillis S, Nakashima A, Amsterdam L, et al: Chlamydia trachomatis infections: Trends in prevalence, incidence or recurrent infection, pelvic inflammatory disease and ectopic pregnancy following a comprehensive program, in Orfila J, Byrne GI, Chernesky MA, et al (eds): *Chlamydia infections.* Bologna, Esculapio; 1994:67-70.

27. Addiss DG, Vaughn ML, Ludka D, Pfister J, Davis JP: Decreased prevalence of Chlamydia trachomatis infection associated with a selective screening program in family planning clinics in Wisconsin. *Sex Trans Dis* 1993;20:28-35.

28. Stamm WE, Clark A: Use of the Abbot LCR assay to identify Chlamydia infected men and women using urine specimens. *Inter Soc Std Res* 1993;p81-(abst).

29. Gaydos CA, Ngeow YF, Jones K, Plier P, Lee H, Quinn TC: Detection of Chlamydia trachomatis (Ct) in urine by ligase chain reaction (LCR) in STD patients in Malaysia. *ICAAC* 1994;#L32:(Abstract)

30. Dille BJ, Butzen CC, Birkenmeyer LG: Amplification of Chlamydia trachomatis DNA by Ligase Chain Reaction. *J Clin Microbiol* 1993;31:729-731.

31. Chernesky MA, Lee H, Quinn TC, et al: Rapid diagnosis of Chlamydia trachomatis urethral infection in symptomatic and asymptomatic men by testing first void urine in a ligase chain reaction assay. *J Infect Dis* 1994;

32. Jones K, Gaydos C, Welsh L, et al: Detection of Chlamydia trachomatis in male and female urine specimens and endocervical specimens using polymerase chain reaction. *Ann Meet Amer Soc Microbiol* 1994;C443:569.(Abstract)

33. Gaydos CA, Reichart CA, Long JM, et al: Evaluation of Syva enzyme immunoassay for detection of Chlamydia trachomatis in genital specimens. *J Clin Microbiol* 1990;28:1541-1544.

34. Clark A, Stamm WE, Gaydos C, et al: Multicenter evaluation of the Antigenz chlamydia EIA for diagnosos of C. trachomatis genital infection. *J Clin Microbiol* 1992;30:2762-2764.

35. Sanders JW, Hook EW, Welsh LE, Shepherd ME, Quinn TC: Evaluation of an enzyme immunoassay for detection of Chlamydia trachomatis in urine of asymptomatic men. *J Clin Microbiol* 1994;32:24-27.

36. Holland SM, Gaydos CA, Quinn TC: Detection and differentiation of Chlamydia trachomatis, C. psittaci, and C. pneumoniae by DNA amplification. *J Infect Dis* 1990;162:984-987.

37. Gaydos CA, Quinn TC, Eiden JJ: Identification of Chlamydia pneumoniae by DNA amplification of the 16S rRNA gene. *J Clin Micro* 1992;30:796-800.

38. Bobo L, Coutlee F, Yolken RH, Quinn TC: Diagnosis of Chlamydia trachomatis cervical infection by detection of amplified DNA with an enzyme immunoassay. *J Clin Microbiol* 1990;28:1968-1973.

39. Gaydos CA, Roblin PM, Hammerschlag MR, et al: Diagnostic utility of PCR-enzyme immunoassay, culture, and serology for detection of Chlamydia pneumoniae in symptomatic and asymptomatic patients. *J Clin Microbiol* 1994;32:903-905.

40. Gaydos CA, Fowler CL, Gill VJ, Eiden JJ, Quinn TC: Detection of Chlamydia pneumoniae by polymerase chain reaction-enzyme immunoassay in an immunocompromised population. *Clin Infect Dis* 1993;17:718-723.

41. Gaydos CA, Eiden JJ, Oldach D, et al: Diagnosis of Chlamydia pneumoniae infection in patients with community acquired pneumonia by polymerase chain reaction enzyme immunoassy. *Clin Infect*

Dis 1994;19:157-160.

42. Gunzenhawser JD, Brundage JF, McNeil JG, Miller RN: Broad and persistant effects of benzathine penicillin G in the prevention of febrile, acute respiratory disease. *J Infect Dis* 1992;166:365-373.

43. Washington AE, Katz P: Cost of a payment source for pelvic inflammatory disease: Trends and projections, 1983 through 2000. *JAMA* 1991;266:2565-2569.

44. Brunham RC, Maclran IW, Binns B, Peeling RW: Chlamydia trachomatis: Its role in tubal infertility. *J Infect Dis* 1985;152:1275-1282.

45. Westrom L, Joesoef R, Reynolds G, Hagdu A, Thompson SE: Pelvic inflammatory disease and fertility: a cohort study of 1,844 women with laparoscopically verified disease and 657 control women with normal laparoscopic results. *Sex Trans Dis* 1992;19:185-192.

46. Cumming DC, Honore LH, Scott JZ, Williams KE: Microscopic evidence of silent inflammation in grossly normal fallopian tubes with ectopic pregnancy. *Int J Fertil* 1988;33:324-328.

47. Katz BP, Caine VA, Jones RB: Estimation of transmission probabilities for Chlamydial infection, in Bowie WR, Caldwell HD, Jones RP, et al (eds): *Chlamydial Infections*. Cambridge, Cambridge University Press; 1990:566-570.

48. Wolner-Hanssen P, Kiviat NB, Holmes KK: Atypical pelvic inflammatory disease: subacute, chronic, or subclinical upper genital tract infection in women, in Holmes KK, Mardh P, Sparling PF, et al (eds): *Sexually Transmitted Diseases*. New York, McGraw-Hill, Inc.; 1990:615-620.

49. Genc M, Ruusuvaara L, Mardh P: An economic evaluation of screening for Chalmydia trachomatis in adolescent males. *JAMA* 1993;270:2057-2063.

50. Paavonen J, Kiviat N, Brunham RC, et al: Prevalence and manifestations of endometritis among women with cervicitis. *Am J Obstet Gynecol* 1985;152:280-286.

51. Rolfs RT, Galaid EI, Zaidi AA: Pelvic inflammatory disease: Trends in hospitalizations and office visits, 1979 through 1988. *Am J Obstet Gynecol* 1992;166:983-990.

52. Schachter J, Grossman M, Sweet RL, Holt J, Jordan C, Bishop E: Prospective study of perinatal transmission of Chlamydia trachomatis. *JAMA* 1986;255:3374-3377.

APPENDIX A

Table 1. Characteristics of Military Women Screened for *Chlamydia trachomatis* at Fort Jackson (PES) Recruits: (n = 9,192)

Variables	No.		%
Mean Age, years (range)	22	(17 - 40)	
Ethnicity			
White	4,771		51.9
African American	3,225		35.1
Other (American Indian, Alaskan, Asian Pacific)	1,196		13.0
Military Category			
Enlisted	9,187		99.9
Officer	5		.05
Having had vaginal sex	8,602		93.6
Sexual History (past 90 days)			
More than one sex partner	2,390		26
New sex partner	2,806		30.5
Consistent condom use	1,429		15.5
Inconsistent condom use	7,289		79.3
Previous Diagnosis			
Neisseria gonorrhoeae	291		3.2
Chlamydia trachomatis	806		8.8
Syphilis	52		.6
Trichomonas	415		4.5
None	7,943		86.4
Chlamydia Positive LCR	828		9.0

Table 2. Characteristics of Volunteers and Non-Volunteers Fort Jackson Recruits

	Volunteers (n = 9192)	Non-Volunteers (n = 610)
Age		
Race, %		
White	51.90	49.18
Black	35.08	33.44
American Indian/Alaskan	1.16	1.15
Asian/Pacific	2.45	2.95
Other[a]	9.40	13.28
Ever having had vaginal sex[*]	93.58	69.51
New sex partner, last 90 days s[†]	30.53	17.87
More than one sex partner, last 90 day[‡]	26.0	17.87
Condom use with every sex act, last 90 days[**]	15.55	21.48
Previous STD		
chlamydia[††]	8.77	2.95
gonorrhea[‡‡]	3.17	1.15
syphilis	.57	.66
trichomonas[***]	4.51	1.97
none [†††]	86.41	87.38

[a] P = .004
[*] P ≤ .000
[†] P ≤ .000, P = .001 when control for vaginal sex
[‡] P = .001, P = .164 when control for vaginal sex
[**] P ≤ .000, P ≤ .000 when control for vaginal sex
[††] P ≤ .000, P ≤ .000 when control for vaginal sex
[‡‡] P = .007, P = .049 when control for vaginal sex
[***] P = .004, P = .062 when control for vaginal sex
[†††] P = .500, P = .043 when control for vaginal sex

Table 3. Univariate Analysis: Factors Associated with Chlamydial Infection Fort Jackson Recruits:

Factor[a]	% Risk of Infection		Odds Ratio (95% C.I.)
	Factor Absent	Factor Present	
Age ≤ 25 (8,012)	2.97	9.90	3.6 (2.55,5.07)
Black race (3,225)	6.10	14.39	2.6 (2.24, 2.99)
Having ever had vaginal sex (8,602)	2.03	9.49	5.1 (2.84, 8.72)
Having had ≥ 1 sex partner, last 90 days (2,390)	7.42	13.51	1.95 (1.68,2.35)
Having had a new sex partner, last 90 days (2,806)	7.36	12.76	1.8 (1.59, 2.13)

Note. P≤ .000

[a] numbers in parentheses indicate the number of women for whom the factor was present

Table 4. Factors Associated Independently with Chlamydial Infection Fort Jackson Recruits:

Factor	Beta Coefficient	Odds Ratio (95% C.I.)
Constant	-1.12	...
Age ≤ 25	-1.23	3.4 (2.41, 4.82)
Black race	-.998	2.7 (2.34, 3.14)
Having ever had vaginal sex	-1.41	4.1 (2.28, 7.29)
Having had ≥ 1 sex partner, last 90 days	-.343	1.4 (1.17, 1.70)
Having had a new sex partner, last 90 days	.397	1.5 (1.23, 1.79)

Note. P≤ .000

Table 5. Strategies for Selective Testing for Chlamydial Infection Fort Jackson Recruits

Strategy	Risk Factor	Sensitivity %	Specificity %	% Identified as Higher Risk	Positive Predictive Value, %	1-Negative Predictive Value, %	Cases Missed
A	Y,B,V,N,M*	100	.32	99.7	9.03	0	0
B	Y,V	100	.5	99.5	9.05	0	0
C	Y,B,N,M	99.3	6.85	93.68	9.52	1.38	8
D	Y,B,N	99.3	7.35	93.22	9.57	1.28	8
E	Y,B,M	98.9	7.41	93.16	9.56	1.43	9
F	V	98.6	6.91	93.58	9.49	2.03	12
G	Y,B	98.4	9.04	91.63	9.68	1.69	13
H	Y	95.8	13.69	87.16	9.90	2.97	35

*Y= young age, B= Black, V= vaginal sex, N=newsex partner, M=more than 1 sex partner

Table 6. Characteristics of Military Women Screened for *Chlamydia trachomatis* at Fort Jackson (TMC) (n = 672)

Variables	No.	%
Median Age, years (range)	22 (18-46)	
Ethnicity[†]		
White	267	39.7
African American	344	51.2
Other (American Indian, Alaskan, Asian Pacific)	58	8.6
Military Category[**]		
Enlisted	667	99.3
Officer	4	.6
Reason for Test		
Sex partner of infected individual	3	.45
Complaint of symptoms	2	.3
Screening	669	99.6
Other	0	
Clinical Presentation[***]		
Mucopus	91	13.5
Cervicitis	56	8.3
Ectopy	14	2.1
Cervical motion tenderness	12	1.8
Friability	12	1.8
Pregnant	25	3.7
Normal exam	23	34.7
Sexual History (past 90 days)		
More than one sex partner	155	23.1
New sex partner	159	23.7
Consistent condom use	192	28.6
Inconsistent condom use	480	71.4
Previous Diagnosis		
Neisseria gonorrhoeae	30	4.5
Chlamydia trachomatis	84	12.5
Syphilis	3	.45
Trichomonas	84	12.5
None	506	75.3
Chlamydia Positive LCR	80	11.9

[†] Data missing from three women (.45%).

[***] Data missing from forty-seven women (7.0%).

Table 7. Characteristics of Military Women Screened for *Chlamydia trachomatis* at Fort Bragg, SC (n = 480)

Variables	No.		%
Median Age, years (range)*	25	(19-47)	
Ethnicity†			
White	181		37.7
African American	244		50.8
Other (American Indian, Alaskan, Asian Pacific)	52		10.8
Military Category**			
Enlisted	439		91.5
Officer	36		7.5
Reason for Test‡			
Sex partner of infected individual	1		.2
Complaint of symptoms	1		.2
Screening	470		97.8
Other	4		.8
Clinical Presentation***			
Mucopus	1		.2
Cervicitis	5		1.0
Ectopy	5		1.0
Cervical motion tenderness	3		.6
Friability	39		8.1
Pregnant	148		30.8
Normal exam	348		72.5
Sexual History (past 90 days)			
More than one sex partner	73		15.2
New sex partner	54		11.3
Consistent condom use	51		10.6
Inconsistent condom use	425		88.5
Previous Diagnosis†‡			
Neisseria gonorrhoeae	20		4.2
Chlamydia trachomatis	86		17.9
Syphilis	5		1.0
Trichomonas	41		8.5
None	348		72.5
Chlamydia Positive LCR	34		7.1
Chlamydia Positive Culture	24		5.0

* Data missing from eight women (1.7%).
† Data missing from three women (.6%).
** Data missing from five women (1.0%).
‡ Data missing from five women (1.0%).
*** Data missing from twenty-seven women (5.6%).
†‡ Data missing from two women (.4%).

Table 8. Univariate Analysis: Factors Associated with Chlamydial Infection Fort Bragg, Patients

Factor[a]	% Risk of Infection		Odds Ratio (95% C.I.)
	Factor Absent	Factor Present	
Age ≤ 25 (254)	2.8	11.0	4.2 (1.72, 10.43)
Having had a new sex partner, last 90 days (53)*	6.8	15.1	2.6 (1.11, 6.10)

Note. P≤ .05

[a] numbers in parentheses indicate the number of women for whom the factor was present

* newsex is not significant when controlled for age.

APPENDIX B

Chlamydia Screening by Risk Factor in Female Recruits n = 9,192

Strategy	Young	Afr.-Amer.	Vag.	New Sex	>1 Sex Pt.	% to Screen	% Positives Identified
I	x	x	x	x	x	99.7	100
II	x		x			99.5	100
III	x	x		x	x	93.7	99
IV	x	x		x		93.2	99
V	x	x			x	93.2	98.9
VI	x	x				91.6	98.4
VII	x					87.2	95.8

Recruit Population
Multivariate Analysis n = 9,192

Variable	O.R.	95% C.I.
< 25 years of age	3.4	(2.41-4.82)
African American	2.7	(2.34-3.14)
Vaginal Sex	4.1	(2.28-7.29)
New Sex Partner	1.5	(1.23-1.78)
> 1 Sex Partner	1.4	(1.17-1.70)

Urine LCR Sensitivity and Specificity Compared to Cervical Culture Asymptomatic Population (PAP Clinic) N = 434*

		Culture	
		+	-
LCR	+	21	11
	-	4	398

		Infected Status**	
		+	-
LCR	+	31	1
	-	4	398

Resolved Sens 88.6% PPV 96.9%
Spec 99.7% NPV 99.0%

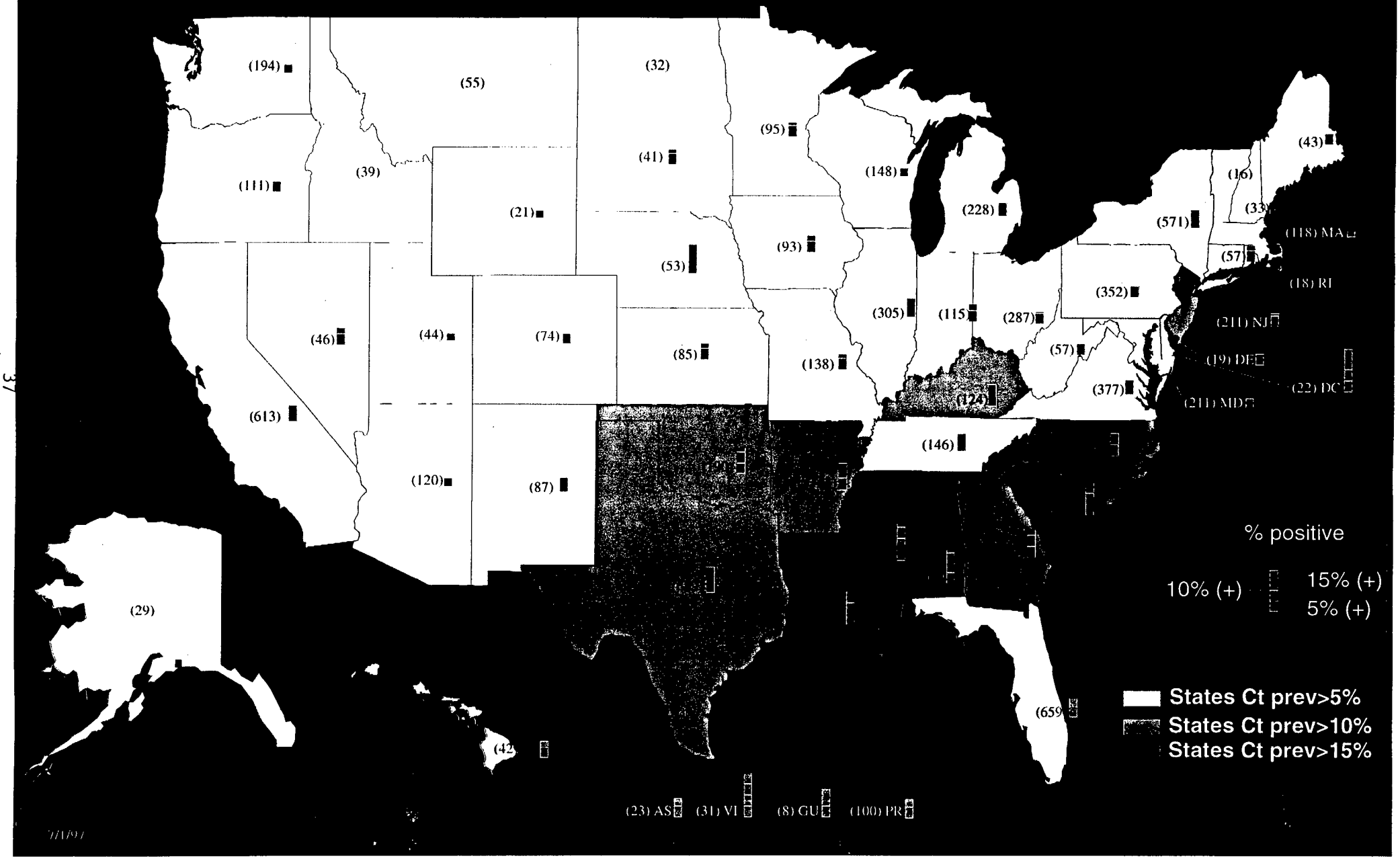
*480 women enrolled--46 w/o matching specimens = 434

** Resolved by DFA, PCR (OMP-1, plasmid genes), LCR OMP-1

State of Origin: New Army Recruit % Ct Positive

(n=9,209)

(# of women coming from each state)



APPENDIX C

3RD ANNUAL

Uniformed Services

RECRUIT & TRAINEE HEALTH CARE

Symposium

AGENDA

"Reducing Attrition, Promoting Health"

STERNBERG AUDITORIUM
(WRAIR BUILDING)

Walter Reed Army
Institute of Research
Washington, DC

May 19-21
1997

HEALTH PROMOTION SECTION

1300-1330 **Nutrition for Performance/Power Performance Video**
MAJ Ann Grediagin, MS, USA
Directorate of Health Promotion and Wellness
USACHPPM, Aberdeen Proving Ground, MD

1330-1350 **"Recruit Tobacco Cessation Counseling Project"**
LT David P. Murphy, MC, USN
Recruit Medicine Clinic, Naval Hospital, Great Lakes, IL

1350-1410 **"Recruit Dermatology Screening and Education Project"**
ENS Gregory D. Buttolph, MSC, USN
Physician Assistant, Naval Hospital, Great Lakes, IL

1410-1430 **Oral Health of U.S. Military Recruits**
LTC Michael C. Chisick, DC, USA
Directorate of Health Promotion and Wellness
USACHPPM, Aberdeen Proving Ground, MD

1430-1500 Break (Exhibit Area Outside Sternberg Auditorium)

1500-1520 **Evaluating Auditory Readiness in the Recruit Population: Ensuring a Fighting Force for Tomorrow**
LCDR Anne R. Shields, MS, USN
MAJ Kathryn E. Gates, MS, USA
Hearing Conservation, Directorate of Clin. Prev. Med.
USACHPPM, Aberdeen Proving Ground, MD

1520-1540 **Vision Conservation in Recruits**
LCDR Lee L. Cornforth, MSC, USN
Vision Conservation, Directorate of Clin. Prev. Med.
USACHPPM, Aberdeen Proving Ground, MD

1540-1600 **What is Health Promotion and Why is it Important for Readness?**
Ms. Judy Harris
Directorate of Health Promotion and Wellness
USACHPPM, Aberdeen Proving Ground, MD

1600-1620 **Health Promotion Panel Discussion**
(Above Speakers) Moderator: LTC (P) Joan Eitzen, ANC, USA

1620-1700 Poster Session Awards, Concluding Remarks

1700 Retirement of Colors

PHYSICAL FITNESS AND INJURY SECTION

1315-1335 **Recruit Physical Fitness, Training and Injuries in the 80s and 90s**
COL Bruce Jones, MC, USA
Director, Epidemiology and Disease Surveillance
USACHPPM, Aberdeen Proving Ground, MD

1335-1355 **The Fort Leonard Wood Recruit Injury Study**
MAJ Leo Mahony, MS, USA
Directorate of Health Promotion and Wellness
USACHPPM, Aberdeen Proving Ground, MD

1355-1415 BREAK (exhibit area outside Sternberg Auditorium)

1415-1425 **The Fitness Training Company at Fort Jackson, SC**
CPT Paul Stoneman, SP, USA
Company Commander, Fitness Training Co. 120th AG Bn
Fort Jackson, SC

1425-1445 **Stress Fractures in Marine Corps Females**
CAPT Ken Long, MC, USN
Senior Medical Officer, Branch Medical Clinic
Parris Island, South Carolina

1445-1505 **Stress Fracture Rehabilitation Challenges and Outcomes at the Navy's Recruit Training Command, Illinois**
LCDR Scott R. Johnson, MSC, USN
Naval Hospital, Great Lakes, Illinois

1505-1525 **The Fort Benning Injury EPICON Study**
MAJ William C. Hewitson, MC, USA
Ms. Michelle L. Canham
Directorate of Epidemiology and Disease Control
USACHPPM, Aberdeen Proving Ground, MD

1525-1600 **Physical Fitness and Injury Panel Discussion**
(Above Speakers)
Moderator: COL Bruce H. Jones MC, USA

1600-1700 Poster Session #2 (3rd Floor WRAIR)(Judging)

Wednesday, May 21

0730-0800 Continental Breakfast (WRAIR)

ADHD AND BEHAVIORAL HEALTH SECTION

0800-0820 **"Im Going to Kill Myself If You Don't Let Me Out of th Army"**
MAJ E. Cameron Ritchie, MC, USA
Department of Psychiatry
Walter Reed Army Medical Center, Washington, DC

1080-0900 **What do You do with recruits who have a history of ADHD?**
CAPT Warren A. Jones, MC, USA
Director, Physical Qualifications and Review
Bureau of Medicine & Surgery, Washington, DC

0900-0920 **The Mental Health Emergency Room at Air Force Basic Training**
MAJ (sel) Jeff Cigrag BSC, USAF
Chief, Behavioral Analysis Service
59th Medical Wing, Lackland, AFB, TX

0920-0945 Break (Exhibit Area Outside Sternberg Auditorium)

0945-1005 **Psychological Services for the Recruit Convalescent Unit**
Dr. Carolyn F. Andrews, Clinical Psychologist
Recruit Evaluation Unit, Naval Hospital, Great Lakes, IL

1005-1025 **Sexual Harassment/Sexual Misconduct at Basic Training Bases**
COL John A. Fulmer,, AG, USA
Deputy Commander of Personnel,
U.S. Army Training and Doctrine Command, Fort Monroe, VA

1025-1130 **ADHD and Behavioral Health Panel Discussion**
(Above Speakers)
Moderator: CDR Larry K. Grubb, MC, USN

1130-1300 Lunch

1615-1630 **Cost Effectiveness Analysis of PAP Smear Screening at Basic Training**
CAPT Ken Long MC, USN
Senior Medical Officer, Branch Medical Clinic
Parris Island, South Carolina

1630-1700 **Exercise Related Mortality in Recruit Basic Training**
COL John W. Gardner MC, USA Professor of Epidemiology
USUHS, Bethesda, Maryland

1800 Buses depart to the Navy Officers' Club for dinner

1830-2000 Dinner at Navy Officers' Club

Special Awards for the Developers of the Adenovirus Vaccines:

Dr. Robert M. Chanock
Dr. Harold S. Ginsberg
Dr. Robert Couch
MG (Ret.) Philip K. Russell MC, USA
COL (Ret.) Franklin H. Top MC, USA
COL (Ret.) Edward L. Buescher Jr., MC, USA

Presentation of Awards by:
COL Joel C. Gaydos MC, USA

Reducing Attrition, Promoting Health: An Historian's View"
Special Guest Speaker:
Dr. Dale C. Smith, USUHS

Tuesday, May 20

0730-0800 Continental Breakfast (WRAIR)

INFECTIOUS DISEASE SECTION

0800-0840 **"Chlamydia Screening in Recruits"**
Dr. Charlotte Gaydos, Assistant Professor,
Infectious Disease Division, School of Medicine,
Johns Hopkins University, Baltimore, MD

0840-0905 **"Sexual Risk Behaviors of Recruits at Fort Jackson, S.C."**
LTC (P) Joan Eitzen ANC, USA
USACHPPM, Aberdeen Proving Ground, MD

0905-0930 **"Serum Titer Directed Immunization"**
LCDR Margaret A.K. Ryan MC, USA
Head, Division of Preventive Medicine
Naval Hospital, Great Lakes, Illinois

0930-0945 BREAK (exhibit area outside Sternberg Auditorium)

0945-1015 **Booster Phenomenon Associated with Sequential**
Tuberculin Skin Testing in Marine Recruits
CDR Edward Gastaldo MC, USN
Medical Epidemiologist, Beaufort, SC

1015-1045 **"Respiratory Disease Control in Military Basic Training Camps"**
CAPT (sel.) Greg Gray, MC, USN
Naval Health Research Center, San Diego, CA

1045-1055 **"National Military Invasive *Streptococcus pyogenes* Surveillance"**
Mr. Tony Hawksworth, Naval Health Research Center
San Diego, CA

1055-1105 **"National Military Advenovirus Surveillance"**
Dr. Pulak Goswami, Naval Health Research Center
San Diego, CA

1105-1140 **"Advenovirus: A Past and Present Treat"**
COL Joel C. Gaydos, MS, USA
Director, Clinical Preventive Medicine
USACHPPM, Aberdeen Proving Ground, MD

1140-1200 **Infectious Disease Panel Discussion**
(Above Speakers)
Moderator: CAPT Jon D. Bayer MC, USN

1200-1315 Lunch (box lunches/poster session #1/3rd Floor, WRAIR)

Sunday, May 18

1800-2000 **Registation;** Mologne House
Walter Reed Army Medical Center

Monday, May 19

0700-0800 Breakfast and Registration; Sternberg Auditorium
Walter Reed Army Institute of Research (WRAIR)

0800-0815 Posting of the Colors/Service Songs

0815-0830 **Welcome from the U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM)**

BG Patrick D. Sculley, USA Commander
USACHPPM, Aberdeen Proving Ground, Maryland

0830-0850 **Overview of Symposium/Administrative Information**
LTC (P) Patrick W. Kelley MC, USA
Director, Division of Preventive Medicine
WRAIR, Washington DC

LTC Ralph Loren Erickson MC, USA
Program Manager, Professional Medical Education
USACHPPM, Aberdeen Proving Ground, Maryland

0850-0920 **The Personnel Costs of Attrition**
LTG Normand G. Lezy, USAF
Deputy Assistant Secretary of Defense for Military Personnel Policy, Pentagon, Washington DC

0920-0940 **The Navy's Perspective on Attrition**
RADM Kevin P. Green, USN
Commander, Naval Training Center
Great Lakes, Illinois

0940-1000 Break (Exhibit area-Sternberg Auditorium)

1000-1020 **The MEPCOM Perspective on Attrition**
COL Lawrence J. Fetters MC, USA
Command Surgeon
USAMEPCOM, N. Chicago, Illinois

1020-1110 **Attrition at a U.S. Army Training Center**
MG William J. Bolt, USA
Commanding General
Fort Jackson, South Carolina

COL Dale Carroll MC, USA
Commander
USAMEDDAC, Fort Jackson, South Carolina

1110-1200 **Attrition at the Coast Guard's Basic Training Base**
LCDR Michael McCloughan, CG
Director of Training
Cape May, New Jersey

LCDR Maura Dollymor, PHS
Director of Health Services
Cape May, New Jersey

1200-1330 Lunch (Local)

1330-1400 **The Health Affairs Perspective of Attrition/ The Need for Objective Measures**
Dr. John F. Mazzuchi
Deputy Secretary of Defense for Clinical Services
Pentagon, Washington, DC

1400-1430 **Accession Medical Standards/Introduction to the AMSARA**
LTC (P) Patrick Kelley MC, USA
Director, Division of Preventive Medicine, WRAIR,
Washington, DC

1430-1500 **The Accession Asthma Standard**
CPT Kathryn L. Clark MC, USA
Division of Preventive Medicine, WRAIR,
Washington, DC

1500-1530 Break (Exhibit area-Sternberg Auditorium)

1530-1615 **Medical Accession Standards Panel Discussion**
(Members of the DoD Working Group)
Moderator: COL Thomas E. Baldwin MC, USAF

Use of Urine Ligase Chain Reaction (LCR) to diagnose C. trachomatis in female soldiers at Ft. Jackson and Ft. Bragg.

C.A.Gaydos, D.Pham, M.R.Howell, B.Pare, D.Ellis, K.Clark, K.McKee, R.Hendrix, J.Gaydos, T.C. Quinn, Johns Hopkins Univ, Balt. MD. Ft. Jackson, SC, Ft Bragg, NC, CHPPM, Aberdeen, MD, NIH, NIAD, Bethesda, MD.

This ongoing study used urine LCR to determine the prevalence of and risk factors for chlamydial infections among military females. Three different populations were screened: recruits who were beginning military service, symptomatic patients attending a Troop Medical Clinic (TMC), and asymptomatic women having a PAP test. Each soldier provided a urine and answered a questionnaire. Urines were tested by LCR (Abbott Labs) and the PAP patients were also tested by cervical culture. In 5,096 women screened, the prevalence was 8.6%. The recruits, TMC, and PAP populations had prevalences of 8.2%, 12.1%, and 7.1%, respectively. The mean age was 22; 50.5% were Caucasian; 23.9% had more than 1 sex partner in the last 90 days; and 26.3% had a new sex partner. Only 17.1% used condoms consistently; 9.7% had a chlamydial infection previously. Univariate analysis identified several risk factors useful for predicting chlamydial positivity: young age, African-American race, more than 1 sex partner, and a new partner. Urine-based screening was effective in screening large numbers of women and was highly acceptable. Compared to culture, the sensitivity of LCRwas 88.2% in the asymptomatic group. A universal or targeted screening program is being developed and should prevent acute chlamydial morbidity and sequelae such as PID.

Presented at the American Society of Microbiology; Miami, Florida; 5/97.
Abstract #C-377

final ISSTDR

Part 4. Type abstract withing the rectangle on this form.

Read all instructions for preparation before typing on this form.

COST-EFFECTIVENESS OF SCREENING vs MASS THERAPY FOR *C. TRACHOMATIS* IN FEMALE ARMY RECRUITS

Howell MR[1], McKee K[2], Ellis D[3], Gaydos J[4], Hendrix R[2], Quinn TC[1,5], Gaydos CA[1]
[1]The Johns Hopkins University, Baltimore, MD; [2]Fort Bragg, NC; [3]Fort Jackson, SC; [4]CHPPM, Aberdeen Proving Ground, MD; [5]NIAID, NIH, Bethesda, MD.

Objective: In US Army women *C. trachomatis* (CT) may cause a significant degree of morbidity. We sought to assess the relative cost-effectiveness of three screening and treatment strategies for CT in a military setting.

Methods: We compared universal and targeted screening to mass therapy with azithromycin for CT in female recruits using a cost-effectiveness analysis. At Fort Jackson, SC 7,191 recruits presenting for basic training from 1/96-3/97 were tested by urine LCR for CT. In a decision model from a military perspective, we assessed the total costs (program, medical, and military) and the level of prevented disease due to CT (PID, chronic pelvic pain, and ectopic pregnancy) associated with each of the 3 strategies. Results were extrapolated to an annual cohort of 13,236 recruits.

Results: The recruit sample had a CT prevalence of 9.56% and a diverse ethnic and geographical background. Approximately 86% were ≤25yrs old.

Strategy n = 13,236	Projected Costs (US$1995)		Projected PID (#) (silent &symptomatic)
	Program	Sequelae	
No Intervention	----------	$973,100	316
Screen ≤25 yrs & Treat (+)	$120,600	$273,000	89
Screen All & Treat (+)	$137,900	$236,400	77
Mass Therapy	$207,400	$138,600	45

Mass therapy dominated both screening strategies, costing ~$16/woman and saving $627,100 over a projected 5 year period (8.2% and 4.9% more than targeted and universal screening, respectively).

Conclusion: Mass therapy in a well defined cohort of young women with a high prevalence of CT would prevent sequelae, would likely decrease the number of discharges for medical reasons in the first 6 mos. of service, and would save overall costs.

Part 5. The author affirms that the material submitted has not been previously published or presented at any national or international meeting; any experimentation has been conducted according to a protocol approved by the institution, commitee on human research or, if no such committee exists, by one which conforms with the principles of the Declaration of Helsinki of the World Medical Association (Clinical Research 14: 193. 1966). The undersigned also certifies that all authors named in the abstract have agreed to its submission for presentation at the International Congress of Sexually Transmitted Diseases, October 19-22, 1997.

Author signature M. Lee Howell Date 4/23/97

Accepted for presentation at the International Society of Sexually Transmitted Disease Research Conference; Seville, Spain; October, 1997